

## Refine Search

### Search Results -

Term	Documents
(10 AND 8 AND 9).USPT.	6
(L8 AND L9 AND L10 ).USPT.	6

Database:

US Pre-Grant Publication Full-Text Database  
 US Patents Full-Text Database  
 US OCR Full-Text Database  
 EPO Abstracts Database  
 JPO Abstracts Database  
 Derwent World Patents Index  
 IBM Technical Disclosure Bulletins

Search:

L11

Refine Search

Recall Text

Clear

Interrupt

### Search History

 DATE: Saturday, March 27, 2004   [Printable Copy](#)   [Create Case](#)
**Set Name Query**

side by side

**Hit Count Set Name**

result set

*DB=USPT; PLUR=YES; OP=ADJ*

<u>L11</u>	l8 and l9 and L10	6	<u>L11</u>
<u>L10</u>	display\$ near4 job information	50	<u>L10</u>
<u>L9</u>	(list or table) near3 job\$1	1158	<u>L9</u>
<u>L8</u>	print job near1 information	144	<u>L8</u>
<u>L7</u>	l5 and L6	1	<u>L7</u>
<u>L6</u>	queue\$1	28534	<u>L6</u>
<u>L5</u>	l1 and L4	1	<u>L5</u>
<u>L4</u>	information near5 print\$	37396	<u>L4</u>
<u>L3</u>	l1 and L2	1	<u>L3</u>
<u>L2</u>	storage\$1	649338	<u>L2</u>
<u>L1</u>	6353484.pn.	1	<u>L1</u>

END OF SEARCH HISTORY

## Refine Search

### Search Results -

Term	Documents
PLURALITY	1521423
PLURALITIES	13375
PLURALITYS	2
PRINT	113850
PRINTS	39329
QUEUE\$1	0
QUEUE	24371
QUEUEC	1
QUEUED	9355
QUEUEE	2
QUEUEH	1
(PLURALITY NEAR5 PRINT QUEUE\$1 ).USPT.	19

There are more results than shown above. [Click here to view the entire set.](#)

**Database:**

US Pre-Grant Publication Full-Text Database  
 US Patents Full-Text Database  
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 Derwent World Patents Index  
 IBM Technical Disclosure Bulletins

**Search:**

L57

**Refine Search**

**Recall Text**

**Clear**

**Interrupt**

### Search History

**DATE:** Thursday, March 25, 2004   [Printable Copy](#)   [Create Case](#)

**Set Name Query**

side by side

**Hit Count Set Name**

result set

*DB=USPT; PLUR=YES; OP=ADJ*

L57   plurality near5 print queue\$1

19   L57

<u>L56</u>	plurality near print queue\$1	14	<u>L56</u>
<u>L55</u>	148 and L54	2	<u>L55</u>
<u>L54</u>	19 and L53	6	<u>L54</u>
<u>L53</u>	12 and L52	6	<u>L53</u>
<u>L52</u>	150 and L51	51	<u>L52</u>
<u>L51</u>	output control near1 apparatus	324	<u>L51</u>
<u>L50</u>	output apparatus	5401	<u>L50</u>
<u>L49</u>	146 and L48	0	<u>L49</u>
<u>L48</u>	print spooler	127	<u>L48</u>
<u>L47</u>	output queue and printer queue	3	<u>L47</u>
<u>L46</u>	143 and L44	24	<u>L46</u>
<u>L45</u>	133 and L44	41	<u>L45</u>
<u>L44</u>	printer control	4724	<u>L44</u>
<u>L43</u>	LAN and L42	33	<u>L43</u>
<u>L42</u>	printer\$1 and 140	51	<u>L42</u>
<u>L41</u>	113 and L40	0	<u>L41</u>
<u>L40</u>	138 and L39	51	<u>L40</u>
<u>L39</u>	list\$1 or table\$	937391	<u>L39</u>
<u>L38</u>	15 and L37	55	<u>L38</u>
<u>L37</u>	134 and L36	74	<u>L37</u>
<u>L36</u>	chang\$ or modify\$	1879515	<u>L36</u>
<u>L35</u>	117 and L34	0	<u>L35</u>
<u>L34</u>	19 and L33	81	<u>L34</u>
<u>L33</u>	13 and L32	90	<u>L33</u>
<u>L32</u>	126 and L31	120	<u>L32</u>
<u>L31</u>	job queue	463	<u>L31</u>
<u>L30</u>	job queue	0	<u>L30</u>
<u>L29</u>	126 and L28	216	<u>L29</u>
<u>L28</u>	print\$ near1 control	14346	<u>L28</u>
<u>L27</u>	job control near1 queue	6	<u>L27</u>
<u>L26</u>	print queue	489	<u>L26</u>
<u>L25</u>	122 and L24	11	<u>L25</u>
<u>L24</u>	cnahge\$ or modify\$	263270	<u>L24</u>
<u>L23</u>	117 and L22	0	<u>L23</u>
<u>L22</u>	120 and L21	11	<u>L22</u>
<u>L21</u>	schedul\$	72809	<u>L21</u>
<u>L20</u>	110 and L19	15	<u>L20</u>
<u>L19</u>	printer.ab.	18922	<u>L19</u>
<u>L18</u>	110 and L17	2	<u>L18</u>
<u>L17</u>	(change\$ or modify\$) near5 115	40	<u>L17</u>
<u>L16</u>	110 and L15	4	<u>L16</u>

<u>L15</u>	job near4 output\$1	1168	<u>L15</u>
<u>L14</u>	l10 and L13	1	<u>L14</u>
<u>L13</u>	(chang\$ or modif\$) near4 schedul\$	4660	<u>L13</u>
<u>L12</u>	l10 and L11	0	<u>L12</u>
<u>L11</u>	output job\$1	284	<u>L11</u>
<u>L10</u>	l8 and L9	28	<u>L10</u>
<u>L9</u>	display or information display	441114	<u>L9</u>
<u>L8</u>	l6 and L7	30	<u>L8</u>
<u>L7</u>	job near1 (Title or name)	705	<u>L7</u>
<u>L6</u>	l4 and L5	119	<u>L6</u>
<u>L5</u>	PDL	2187	<u>L5</u>
<u>L4</u>	l2 and L3	641	<u>L4</u>
<u>L3</u>	printer\$1 near4 (network\$ or LAN)	4456	<u>L3</u>
<u>L2</u>	l1 near4 printer\$1	4623	<u>L2</u>
<u>L1</u>	state\$1 or status\$2	1432493	<u>L1</u>

END OF SEARCH HISTORY

First Hit   Fwd Refs**End of Result Set**☐ **Generate Collection** **Print**

L14: Entry 1 of 1

File: USPT

May 27, 2003

DOCUMENT-IDENTIFIER: US 6570605 B1

TITLE: Print control apparatus and print control method capable of interruption printing

Brief Summary Text (7):

Also, in case such another user sends the print job to the printer through the network, there is required a useless work of visiting the printer in a distant location repeatedly in order to check the progress of the printing work.

Detailed Description Text (5):

Referring to FIG. 1, a main body 100 of the LBP (hereinafter simply written as printer) receives and analyzes PDL data or job control data from an externally connected host computer 200 (FIG. 2), then executes dip map development based on such data, further converts the bit map data into video data (video signal) and forms an image on a recording sheet based on the video data.

Detailed Description Text (7):

A printer controller 101 processes the PDL data and job control data supplied from the host computer 200. The printer controller 101 converts the entered PDL data into a video signal, and sends such video signal to a laser driver 102. It also informs the host computer 200 of various status of the printer. Also according to the entered job control data, it interrupts the job in current printing, or executes a print job which is already received or is to be received in preference for the print job in current processing, or changes the order to output of the print jobs held in the printer.

Detailed Description Text (15):

A keyboard controller (KBC) 215 controls the key input from a keyboard (KB) 220 and an unrepresented pointing device. A CRT controller (CRTC) 216 controls the display on a CRT display (CRT) 230.

Detailed Description Text (17):

A printer controller (PRTC) 218 is connected to a printer 202 through a predetermined bidirectional interface 201, thereby controlling the communication with the printer 202. If the print information is outputted to a network printer, a network I/F card (NIC) is used as the PRTC 218.

Detailed Description Text (18):

The CPU 211 executes development (rasterization) process of the outline font in a display information RAM provided for example in the RAM 212, thereby realizing WYSIWYG on the CRT 230. Also the CPU 211 opens various registered windows and executes various data processings based on commands instructed by an unrepresented mouse cursor displayed on the CRT 302.

Detailed Description Text (22):

A job memory 257 temporarily stores the entered PDL data, and is composed for example of a RAM or a hard disk. The engine interface 256 receives the bit map data from the frame memory 309 and converts such bit map data into video data for supply

to the printer engine 270.

Detailed Description Text (27):

In FIG. 3, the host computer 200 and the printer 202 are connected through a bidirectional interface 201 (printer cable or network cable). In case of a network cable, there are omitted various connection devices present between the host computer and the printer.

Detailed Description Text (29):

The printer 201 is composed of a printer controller 250 and a printer engine 270. The printer controller 250 is composed of an input unit 251, a job controller 306, a job memory 257, a PDL analyzer 307, a bit map developer 308, a frame memory 309 and a printer I/F 256, and the job memory 257 is composed for example of a hard disk or a RAM.

Detailed Description Text (30):

The user of the host computer 200 and the printer 202 executes a printing operation by operating the application program 301. The print data outputted from the application program 301 are converted in the printer driver 302 into PDL data A that can be interpreted by the printer 202, and job control data B. The PDL data A and the job control data B are supplied to the spooler 303, which temporarily stores the PDL data A and the job control data B in a file, and then reads and sends the PDL data A and the job control data B to the language monitor 304.

Detailed Description Text (31):

The language monitor 304 transfers the received PDL data A and job control data B to a communication driver 305, which transmits the PDL data A and the job control data B to the printer 202 through a printer cable or a network cable.

Detailed Description Text (32):

The PDL data A and the job control data B, transferred from the host computer 200 to the printer 202, are further transferred through the input unit 251 to the job controller 306. The job controller 306 analyzes the job control data thereby executing a process according to the content of the received job control data, and also stores the PDL data A in the job memory 257.

Detailed Description Text (33):

The PDL data A stored in the job memory 257 are read by the PDL analyzer 307 basically according to the order of storage (order of reception), and the PDL analyzer 307 analyzes the PDL data A to generate an intermediate code C, which is data of a format suitable for bit map development by the bit map developer 308.

Detailed Description Text (34):

The intermediate code C, generated by the PDL analyzer 307, is bit map developed in the bit map developer unit 308, and the resulting bit map data D are stored in the frame memory 309. The engine I/F 256 sends the video data to the printer engine 270 according to the bit map data D stored in the frame memory 309. As a result, for example the laser beam is on-off controlled to record the print result (image) on the recording medium such as paper.

Detailed Description Text (38):

The job control data (2) are a "job schedule change command", which changes the order of printing of a designated printing job among the print jobs stored in the job memory 257.

Detailed Description Text (48):

The job table 410 is composed of tables respectively corresponding to all the print jobs currently stored in the printer 202. Each table is composed of a usage flag 411 indicating whether the table is currently in use, a job ID 412 indicating the ID number of the job, a file name 413 representing the file name of the job in the

file system, a previous job address 414 indicating the table of an immediately preceding job, a next job address 415 indicating a next job table, an interruption flag 416 indicating whether interruption is being executed, a resume page information 417 storing information for resuming the job in case interruption is executed, a suspension flag 418 indicating whether the job is temporarily suspended, and an owner ID 419 (for example a student number or an employee number) representing the user (owner of the present print job) executing the printing operation.

Detailed Description Text (51):

FIG. 5 is a view showing an example of the operation panel 258 of the printer 202, wherein provided are an LCD display unit 501 for displaying various messages and information for operation, keys 502 to 506 for executing various operations on the printer, an LED display unit 507, a magnetic card reader 259 and a bar code reader 255.

Detailed Description Text (53):

(A) By operating the keys of the operation panel 258, the user can cause the LCD display unit 501 to display the owner ID of a job which is currently stored in the printer 202 and can be designated for the interruption printing. The display shifts to the owner ID of a next job by depression of a leftward arrow key 504 or a rightward arrow key 505. The user of the printer can designate the interruption printing for a print job of the user, by selecting the ID number of the user and depressing an execution key 506.

Detailed Description Text (57):

At first, when the user selects the display of a print job list on the utility software, there is displayed an image as shown in FIG. 9. In this operation, the utility software transmits the job control data to the printer 202, in order to acquire the list of the print job. Thus, there can be acquired the information of the print jobs registered in the job management table 400.

Detailed Description Text (63):

On the other hand, if the step S601 identifies that the interruption print command is absent, the sequence proceeds to the step S603 for discriminating whether the owner ID of a job desired for interruption printing has been designated by the LCD display unit 501 and the key of the operation panel 258 of the printer 202. If the interruption has been designated from the operation panel 258, the sequence proceeds to the step S607, and if not, to the step S604.

[First Hit](#)   [Fwd Refs](#)

Generate Collection

Print

(2)

(4)

L57: Entry 7 of 19

File: USPT

Apr 17, 2001

DOCUMENT-IDENTIFIER: US 6219148 B1

**\*\* See image for Certificate of Correction \*\***

TITLE: Printer spooler output apparatus and method with computer program and memory storage medium

Detailed Description Text (6):

In the ordinary print mode, print data received from a plurality of computers 160 is registered in a print queue 210 in the order of print data reception. In the sequential print mode, a sub-queue 220 is formed, print data received from the computer 160 which instructed the sequential print is sequentially registered in the sub-queue 220, and sub-queue data 230 for managing the sub-queue 220 is registered in the print queue 210.



[First Hit](#)   [Fwd Refs](#)☐ [Generate Collection](#) [Print](#)

L25: Entry 4 of 11

File: USPT

Feb 2, 1999

DOCUMENT-IDENTIFIER: US 5867636 A

TITLE: Client server symmetric presentation-layer connection protocol for network printing systems

Abstract Text (1):

A printing system is provided for interfacing one or more session level protocols within the system to achieve an enhanced communications between the host computer and the network printer. A client server connection protocol (CSCP) facilitates this connectivity by providing a symmetric protocol for connections between servers and clients over connection-based stream-oriented protocols such as AppleTalk Data Stream Protocol (ADSP) and Transmission Control Protocol (TCP). CSCP resides in the presentation layer of the OSI seven-layer model and interfaces with one or more session level protocols. The dynamic port negotiation of CSCP facilitates concurrency for server applications by off-loading the port negotiation that would otherwise have to take place by the server and its clients. Thereby, CSCP allows the printing system to be easily extended and integrated with new protocol/ports as they are developed and introduced.

Brief Summary Text (2):

The present invention is directed to a network printing system having a client server connection protocol (CSCP) for interfacing one or more session level protocols within the system to achieve and enhance communication between the host computers and the network printer. More particularly, CSCP provides a symmetrical protocol for facilitating connections between servers and clients over connection-based stream-oriented protocols by off-loading port negotiation that would otherwise have to be performed by the server and its clients.

Brief Summary Text (4):

As the size of networked systems increases from a few connected computers located near each other to several thousand machines of various types and sizes scattered at great distances from each other, the demands on the network printers also increase. One of the most challenging demands in the implementation of network printers is connectivity. Typically, the network printer is a stand-alone peripheral device which is desired to perform in an increasing number of network and non-network communication environments. In network environments, the printer is desired to provide "seamless plug and play" connectivity for the continuous expansion of network service protocol/ports. For example, known network service protocol/ports that are desired to communicate with network printers are: printer access protocol (PAP)/LocalTalk (LT); PAP/EtherTalk (ET); transmission control protocol/internet protocol (TCP/IP); TCP/IP port 9100; LPR/TCP/IP; Novell remote printer or print server modes; bidirectional or unidirectional Centronics; AppleTalk Data Stream Protocol (ADSP)/EtherTalk; ADSP/LocalTalk; and Novell sequence packet exchange (SPX). These are just a few examples of the constantly increasing number of network protocol/ports that desire "plug and play" connectivity to the network printer.

Brief Summary Text (5):

A printer is a peripheral device that can be shared on a network connected to a print server. Also, a printer can directly connect to the network by including a network interface card or the network interface into the printer which allows the

printer to run its own print server software and function as a regular node. In a typical Windows environment, the network printer is a one-way printer. In a one-way printer, the only communication path is from the host computer to the printer. As a result, the data is sent from the host computer to the printer without any ability for the printer to notify the host computer of the job status such as whether the print job has been successfully completed.

Brief Summary Text (6):

The use of a two-way printer has been developed for Macintosh systems (Apple Computer, Cupertino, Calif.). In the AppleTalk protocol used by the Macintosh systems, PAP is the protocol used for communication between the Macintosh host computers and printers. PAP sets up, maintains and terminates the connection between the host computer nodes and the network printer and also transfers the data from the host computers to the printers. PAP allows two-way communication from the network printer to the Macintosh host computer to the extent that the status of the network printer is sent to the Macintosh host computer through PostScript. However, most page description language (PDL) interpreters only allows one job to be processed at one time which prevents asynchronous interaction between multiple clients and the network printer.

Brief Summary Text (7):

Typically, networks utilize shared resource printers. FIG. 1 illustrates the use of a conventional shared resource printer in a network. A plurality of host computers 1.sub.0, 1.sub.1, . . . 1.sub.n and a printer 5 are connected in a network. The printer 5 includes a disk 6 connected internally or externally to the printer 5 for storing the print jobs sent from the host computers 1.sub.0..n before being printed by the printer 5. In shared resource printers, the host computer that first sends a print job to the network printer will have its job printed. Other host computers attempting to have a print job printed by the network printer while another job is being printed will not be able to access the network printer. Therefore, these host computers will repeatedly try to access the network printer during a timing scheme until the network printer becomes available. As a result, the speed of the network will be reduced by the network traffic due to the continuous polling of the host computers to the network printer during the time that the network printer is unavailable. This polling process is undesirable since a host computer will gain access to the printer, with only limited and possibly inexact arbitration after the print job is completed if a number of host computers are attempting to gain access while the printer is busy.

Brief Summary Text (8):

Traditionally, print servers provided access to the network printers and ran the programs necessary to create and operate a print queue for jobs sent to the printers from the host computers. The print queue is a directory that stores into the disk 6 the print jobs waiting to be printed. The print jobs are then printed from the print queue in an FIFO sequence. The print servers require storing the job request and entire job data by spooling this data to the disk 6. Depending on the job size, millions of bytes of data may be spooled to the disk and therefore a large sized disk is necessary.

Brief Summary Text (10):

Print servers and a printer may be combined in the same machine on many networks for economical reasons. The main advantage for combining the printer and print servers is that files do not need to be sent from the host computer to the print server machine and then from there to the printer in such a configuration. However, the disadvantage of combining the printer and print servers is that the required control for the print queue and the printing activity takes away CPU time from other network activity. In either case, a disk is required to store the data for the entire print job and since the print job is sent from the host computer, spooled to a disk and then transmitted to the network printer when the printer becomes available, unnecessary network activity results.

Brief Summary Text (11):

Accordingly, it is desired to provide a network printing system which enhances the two-way communication between the host computers and the network printer. Further along these lines, it is desirable to provide a symmetrical protocol for facilitating connections between servers and clients over connection based-stream oriented protocol such as ADSP and TCP.

Detailed Description Text (2):

FIG. 2 provides an illustrative embodiment for the layers of the architecture of the network printing system for implementing CSCP in an embodiment of the present invention. Each of these layers provides a normalized interface with the lower layers and their relationship will be described from the lower layers, which interact with the clients, to the upper layers where all of the protocols/ports interact with the printer in essentially the same way. The interfacing of these layers may be implemented in one or more static memory devices, such as a ROM, which is installed within the network printer.

Detailed Description Text (5):

IDP network managers 30 provide an interface for IDP protocol/ports. Some examples of protocol/ports that are presently configured for IDP mode communication include ADSP/EtherTalk, ADSP/LocalTalk, SPX (Novell), TCP/IP and bi-directional Centronics. These protocol/ports are able to communicate with all of the IDP features which enhance the two-way communication between the host computers and the network printer. However, many other existing protocol/ports may be modified to support IDP and new protocols/ports may be created to support IDP. The interface of the IDP network managers with these IDP protocol/ports is preferably accomplished with a modified version of the Berkeley socket interface.

Detailed Description Text (7):

A parallel port manager 20 provides both a non-IDP UNIX I/O interface and an IDP capable socket interface. The parallel port manager 20 is designed to support a host computer port which alternates between using IDP and non-IDP drivers/utilities to interact with the network printer. An example of such a port is a bi-directional Centronics port. IDP mode communication over Centronics ports should take place using a session/transport/network layer protocol. One example of such a session/transport/network layer protocol is a socket simulation protocol (SSP) for allowing the Centronics port to be used in the same way as other network ports. The parallel port manager 20 is able to automatically sense the transitions between SSP and non-SSP data over Centronics ports.

Detailed Description Text (10):

Furthermore, CSCP facilitates reconnection to previously connected hosts. IDP uses the reconnection mechanism to implement remote queuing features, to subsequently request job data, and to send asynchronous status updates to clients which support IDP. More particularly, IDP only stores the job data request at the printer when the printer is busy printing another job, and the actual job data will remain locally at the host computer. Thereafter, the network printer will call back the host computer which corresponds to the first job data request queued in the print queue after the current print job is completed.

Detailed Description Text (18):

The system services layer 70 interfaces with an IDP server 80 and a page description language (PDL) interpreter 90. The IDP server 80 is an application layer network protocol for enhancing the two-way communication between a host computer and the network printer. The IDP server 80 is independent of the network layers below and only requires that the transport be bidirectional. The IDP server 80 allows access to shared information in the network printer and enables two-way communication between the network clients and the network printer to exist at an enhanced level.

Detailed Description Text (19):

Some of the enhanced two-way communication provided by the IDP server 80 includes reading and modifying system parameters, adding and removing fonts, submitting print jobs and manipulating the print queue. By enabling clients of the printer to make job requests which are entered in the print queue without sending the actual print job data, an enhanced set of services for submitting print jobs, retrieving print data queue and asynchronously notifying clients with job status may be achieved. The PDL interpreter 90 may be provided for supporting PostScript, for example. Additional PDL interpreters may be provided to support other languages as desired. The presentation level data from non-IDP protocols/ports is assumed to be PDL data in the example configuration for the present embodiment. The non-IDP network managers 10 and the parallel port managers 20 may be implemented with a UNIX standard I/O interface in a preferred embodiment. The IDP emulator 40 then handles all of the non-IDP protocols/ports, provides a socket interface and emulates the CSCP/IDP interaction necessary to execute print job requests.

Detailed Description Text (20):

In one example of a header format for IDP messages, the structure includes protocol, command, result code, message byte length, and data fields. IDP is a set of related protocols and the protocol suites are intended to map different cooperating servers that add value to a printing environment. A message can be initiated by either a host computer or the network printer. Currently, IDP includes a core protocol, a print protocol, and a font protocol. The core protocol contains commands that are common to all servers and are independent of their type. Printers may support the print protocol and font servers may support the font protocol. Common printers maintain fonts locally and therefore support part of the font protocol as well. As new type of servers are identified, additional protocols can be added to the suite of related protocols for IDP. The protocol field indicates which protocol of the IDP suite that the message is intended for. The command field indicates which command that the message corresponds to. The result code is a result of the command that is ignored on request commands. The message byte length field is the number of data bytes in the message. The data field includes message specific data and parameters.

Detailed Description Text (22):

The system services layer 70 is connected to the connection manager 61. The system services layer 70 provides interaction between the IDP server 80 and the PDL interpreter 90. The IDP server 80 is shown in FIG. 3 to include a print queue 82 and a job dispatcher 84. The PDL interpreter 90 interacts with the IDP server 80 when the job dispatcher 84 dispatches a job from the print queue 82. The information from the print queue 82 proceeds through the layers to connect with a client and obtain the actual print job data that will proceed from the client back up through the layers to the PDL interpreter 90 for printing at the network printer.

Detailed Description Text (23):

FIG. 4 illustrates a process for connections between IDP clients and the printer for an embodiment of the present invention. At step S600, an IDP host and IDP network manager opens a connection to a well known CSCP port. The connection is received by the connection services layer 60 via the socket services 50 at step S602 and the IDP host sends a CSCP request service port request at step S604. The connection services 60 receives the CSCP request at step S606 and a pending open from the IDP server 80 is received from the connection services 60 via the system services layer 70 at step S608. At step S610, the IDP host issues a print job request to the IDP server 80 and the IDP server 80 queues the print job in the print queue 82 at step S612 before closing the connection at step S614. The system services layer 70 dequeues the print job request at step S616, and issues a reconnection request at step S618. The connection services layer 60 issues and active open to the host via the socket services layer 50 and the I/O manager 30 at

step S620 and the connection services layer 60 also sends a CSCP request service port to the host at step S622. At step S624, the connection services layer 60 returns from a reconnection request via the system services layer 70. The system services layer 70 issues "a send job data" IDP request to the host at step S626 and then the systems services layer 70 sends the I/O stream to the PDL interpreter 90 at step S628. The host sends and receives data to and from the PDL interpreter 90 at step S630 and the host closes the connection at S632 when the sending and receiving of data is completed.

Detailed Description Text (24):

FIG. 6 illustrates a network configuration of a printing system for an embodiment of the present invention. In FIG. 6, a plurality of host computers 400.sub.0, 400.sub.1, . . . 400.sub.n and a printer 410 are connected in the network. The printer 410 includes a ROM 412, a RAM 414, and a CPU 416. The ROM 412 implements the layers of architecture for interfacing the host computers 400 . . . .sub.n with the printer 410 in conjunction with the CPU 416. More than one ROM may be used to implement the layers of the architecture. The RAM 414 is used to implement the print queue 82 in the present embodiment. Because the print queue 82 only stores job information data without storing the actual print data, a small sized RAM 414 is used in contrast to a larger sized spooling disk as is conventionally used.

Detailed Description Text (25):

The print queue 82 contains job information for all of the print jobs that have an outstanding print request to the printer 410 for any of the host computers 400.sub.0 . . . n on the network. A print job request call is one example of the process for enabling communication with the print queue 82. Prior to sending a print job with a print job request call, the host computer sends a print request and a job ID is returned by the printer. When the print request is accepted, the job information is placed in the print queue 82. The parameters of the print job request call may include information about the print job and information for enabling the printer to notify the host computer when the job data can be accepted. When the printers are ready to capture the print job data, the printer may initiate a transmit job call which tells the host computer to start transmitting the print job to the printer. As print jobs are completed, their job information is removed from the print queue and entered into a job log. The job information in the print queue 82 may include the job name, the estimated time to print, the document status, the number of pages in the document, the number of pages left to print, the image content, the user comment, the media, and the creator application. The print job request call may provide this information and this information must be presented with the job in order to display the job information.

Detailed Description Text (28):

A transmit job command is transmitted from the printer to inform the host computer to start transmitting the print job referred to by the job ID and an enumerate queue command is transmitted from the host computer and returns an ordered list of the jobs in the specified queue. The enumerate queue command counts parameters in the print queue and count records are returned in the order that they are scheduled to be printed for the print queue in the order that they were printed for the job log. A job record parameter may be included for estimating the time when the job will complete printing or the time that the job did complete. A token parameter may be used to represent the state of the queue.

Detailed Description Text (29):

FIG. 5 illustrates a process for connections between non-IDP clients and the printer for an embodiment of the present invention. At step S701, a host requests a connection and an I/O manager increments a pending connection count at step S703. The IDP emulator 40 polls the I/O manager for the current pending connection at step S705 and the IDP emulator generates a CSCP request service port request at step S707. The connection services 60 receives a CSCP request at step S709 and a pending open from the IDP server 80 is returned from the connection services 60 via

the system services 70 at step S711. The IDP emulator 40 then issues a print job request to the IDP server 80 at step S713 and the IDP server queues a print job at step S715. The IDP emulator 40 then closes the connection to the IDP server 80 at step S717 before the system services 70 dequeues the print job request at step S719 and then issues a connection request at step S721. The connection services 60 issues an active open call to the IDP emulator 40 via the socket services 50 at step S723 and sends a CSCP request service port to the IDP emulator 40 at step S725. The connection services 60 returns from the reconnection request via the system services 70 at step S727 and then the system services 70 issues a "send job data" IDP request to the IDP emulator 40 at step S729. The IDP emulator 40 opens a connection to the corresponding I/O manager at step S731 and the corresponding I/O manager accepts the open connection request from the host at step S733. Next, the system services 70 sends the I/O stream to the PDL interpreter 90 at step S735, the host sends and receives data to and from the PDL interpreter 90 at step S737 before closing the connection to the host at step S739 when the sending and receiving of data is completed.

Detailed Description Text (30):

IDP provides an application layer network protocol that enhances the two way communication between a host computer and a network printer. IDP operates independently of the network layers below it and only requires that the transport protocol/port be bidirectional. A wide variety of heterogeneous network protocols may be supported by IDP which places all of the incoming print job information in the print queue regardless of the protocol. Print job information from both IDP and non-IDP protocol/ports may be placed in the print queue by emulating IDP on the non-IDP protocol/ports. By emulating IDP on the non-protocol/ports, every client will look like IDP clients to the printer and clients of non-IDP protocols will therefore be completely backward compatible. Although non-IDP clients will not be able to use all of the enhanced features provided by IDP, a sufficient amount of information will be provided from the non-IDP protocol/ports so that all of the jobs in the print queue will be able to be fairly arbitrated. For example, complete job name information will not be provided to the print queue for non-IDP clients and only information that a print job has been sent from a particular port will be entered in print queue. Thereby, print jobs from non-IDP clients may be entered in the print queue without having to store the actual print job data at the printer. Accordingly, the printing system for the embodiments of the present invention enable a wide variety of heterogeneous network protocols to be fairly arbitrated at the printer.

CLAIMS:

1. A heterogeneous network printing system comprising:

a plurality of host computers;

a plurality of heterogeneous network service protocols/ports for connecting said host computers to the network;

a printer connected to the network; and

a symmetric presentation-layer connection protocol interface for facilitating connections between said host computers and said printer over stream oriented protocols, wherein each of said host computers and said printer can initiate a network connection using said symmetric connection protocol interface.

5. A method for providing connections in a heterogeneous network printing system comprising the steps of:

(a) connecting a plurality of host computers to a printer in a network by a plurality of heterogeneous network service protocols/ports; and

(b) using a symmetric presentation-layer connection protocol interface to facilitate connections between said host computers and said printer over stream oriented protocols, wherein each of said host computers and said printer can initiate a network connection using said symmetric connection protocol interface.

15. A method for conducting communications between a host computer and a printer in a network computing system, comprising the steps of:

(a) connecting the host computer to the printer using a stream-oriented network service protocol; and

(b) using a symmetric presentation-layer connection protocol interface to facilitate the connection between the host computer and the printer over the stream oriented protocol, wherein each of said host computer and said printer can initiate the connection using said symmetric connection protocol interface.

30. A heterogeneous network printing system comprising:

a plurality of host computers;

a plurality of heterogeneous network service protocols/ports for connecting said host computers to the network;

a printer connected to the network; and

a presentation-layer connection protocol interface for facilitating connections between said host computers and said printer over stream oriented protocols, wherein said connection protocol interface enables said printer and each of said host computers to initiate a network connection.

31. A method for providing connections in a heterogeneous network printing system comprising the steps of:

(a) connecting a plurality of host computers to a printer in a network by a plurality of heterogeneous network service protocols/ports; and

(b) using a presentation-layer connection protocol interface to facilitate connections between said host computers and said printer over stream oriented protocols, wherein said connection protocol interface enables said printer and each of said host computers to initiate a network connection.

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L11: Entry 4 of 6

File: USPT

Jan 30, 2001

DOCUMENT-IDENTIFIER: US 6181436 B1

TITLE: Print managing system and print managing method

Abstract Text (1):

A print managing system has: client apparatuses for generating print data and sending the generated print data to a printing apparatus; and the printing apparatus connected with each of the client apparatuses though a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is an unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job. Each of the client apparatuses generates the print data and sends the print data to the printing apparatus. The printing apparatus receives the print data and manages the print data as the print job. Further, the printing apparatus produces the rough image on the basis of the print data. When receiving the request signal sent from each client apparatus, the printing apparatus sends the print job information to each client apparatus. The print job information includes the management information of the print job managed by the printing apparatus and the rough image correlated with the print data corresponding to the print job. When receiving the print job information from the printing apparatus, each client apparatus displays the management information and the rough image included in the received print job information.

Brief Summary Text (7):

Further, information of the print jobs managed by the print spool function are displayed as a list by each client apparatus, the printing apparatus or the print sever apparatus, and a user can order to change the printing order, cancel or stop the printing operation, etc. by viewing the displayed list of the information of the print jobs.

Brief Summary Text (8):

Namely, identification information of the client apparatus by which the print data corresponding to each print job is outputted, identification information called a print job name and information of a data capacity to be printed out, a reception time of a print job or the like are displayed as the information of each print job. The user can select the desired print job by viewing these information, and give his or her orders to the client apparatus.

Brief Summary Text (12):

According to such a method, it is possible to confirm a content of the print data. However, in such a method, it is difficult to confirm the plural print jobs simultaneously, so that the user cannot easily select a desired print job from the plural print jobs managed by the print spool function. In order to enable easy selection of the desired print job from the plural print jobs managed by the print spool function, a list of the print jobs is required.

Brief Summary Text (17):

According to the present invention, the aforementioned first object can be achieved by a print managing system having: a plurality of client apparatuses for generating print data and sending the generated print data to a printing apparatus; and the printing apparatus connected with each of the client apparatuses though a network



for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is an unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, each of the client apparatuses having: a print data generating device for generating the print data; a print data sending device for sending the generated print data to the printing apparatus; a print job information request device for sending a request signal to request print job information to the printing apparatus; a print job information receiving device for receiving the print job information from the printing apparatus; and a print job information display device for displaying the received print job information as a list, in which management information of the print job and a rough image correlated with the print data corresponding to the Print job included in the received print job information are arranged, the printing apparatus having: a print data receiving device for receiving the print data from each of the client apparatuses; a print data storing device for storing the received print data; a rough image producing device for producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data; a rough image storing device for storing the produced rough image, and correlating the produced rough image with the stored print data on which the produced rough image is based; a print job managing device for managing the stored print data as the print job; a request receiving device for receiving the request signal from each of the client apparatuses; and a print job information sending device for sending the print job information including the management information to identify the print job managed by the print job managing device and the rough image correlated with the print data corresponding to the print job to each of the client apparatuses in response to a reception of the request signal.

Brief Summary Text (19):

Next, in each of the client apparatuses, the print job information request device sends the request signal to the printing apparatus. The request signal is a signal to request the printing apparatus to send the print job information. Then, in the printing apparatus, the request receiving device receives the request signal from each of the client apparatuses. In response to the request signal, the print job information sending device sends the print job information. The print job information includes the management information of the print job managed by the print job managing device and the rough image correlated with the print data corresponding to the print job.

Brief Summary Text (20):

Further, in each of the client apparatuses, the print job information receiving device the print job information from the printing apparatus, the print job information display device displays the received print job information as the list. Namely, the management information of the print job and the rough image correlated with the print data corresponding to the print job are arranged in the list.

Brief Summary Text (21):

Thus, when a user views the list, the user can easily identify the print job by the rough image. In a case that a plurality of the print data are sent from each of the client apparatuses to the printing apparatus sequentially or simultaneously, the print job managing device manages the plurality of print jobs. In this case, the print job information includes the management information of the plurality of the print jobs and the plurality of the rough images corresponding to the print jobs. Thus, in each of the client apparatuses, the list in which the management information of the plurality of the print jobs and the plurality of the rough images corresponding to the print jobs is displayed. When the user views this list, the user can easily identify the print jobs by the rough images, and select the print jobs easily and correctly.

Brief Summary Text (22):

On the other hand, in a case that the print data in the printing apparatus includes

data corresponding to a plurality of pages, the rough image producing device may produce a plurality of the rough images each corresponding to respective one of the plurality of pages. In this case, the print job information request device sends page information to select one or more pages from the plurality of the pages to the printing apparatus, together with the request signal. Then, in the printing apparatus, the request receiving device may receive the page information from each of the client apparatuses, together with the request signal, and the print job information sending device may send the print job information including the management information and the rough images of only pages selected on the basis of the received page information. Thus, in each of the client apparatuses, the rough images of only the selected pages are displayed. Accordingly, even if there is common print data in a plurality of print jobs, it is possible to surely identify each print job.

#### Brief Summary Text (23):

Moreover, in the printing apparatus, the rough image producing device may change a shape of a line forming a contour of the produced rough image according to a size of printing paper to be used for printing the stored print data. Further, the rough image producing device may change a size of the produced rough image according to a size of printing paper to be used for printing the stored print data. Accordingly, since only the necessary minimum rough images are sent to the client apparatus, it is possible to quickly display the print job information.

#### Brief Summary Text (24):

According to the present invention, the aforementioned second object can be achieved by a printing managing system having: a plurality of client apparatuses for generating print data and sending the generated print data to a printing apparatus; and the printing apparatus connected with each of the client apparatuses though a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is an unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, each of the client apparatuses having: a print data generating device for generating the print data; a print data encryption device for encrypting the generated print data; a print data sending device for sending the encrypted print data to the printing apparatus; a print job information request device for sending a request signal to request print job information to the printing apparatus; a print job information receiving device for receiving an encrypted print job information from the printing apparatus; a print job information decryption device for decrypting the received print job information; and a print job information display device for displaying the decrypted print job information as a list, in which management information of the print job and a rough image correlated with the print data corresponding to the print job included in the decrypted print job information are arranged, the printing apparatus having: a print data receiving device for receiving the encrypted print data from each of the client apparatuses; a print data decryption device for decrypting the received print data; a print data storing device for storing the decrypted print data; a rough image producing device for producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data; a rough image storing device for storing the produced rough image, and correlating the produced rough image with the stored print data on which the produced rough image is based; a print job managing device for managing the stored print data as the print job; a request receiving device for receiving the request signal from each of the client apparatuses; a print job information encryption device for encrypting the print job information including the management information to identify the print job managed by the print job managing device and the rough image correlated with the print data corresponding to the print job; and a print job information sending device for sending the encrypted print job information to each of the client apparatuses in response to a reception of the request signal.

Brief Summary Text (25):

Namely, in each client apparatus, before sending the print data, the print data encryption device encrypts the print data, and encrypted print data is sent to the printing apparatus. Then, in the printing apparatus, the print data decryption device decrypts the receiving print data, and the decrypted print data is stored. Further, in the printing apparatus, before sending the print job information, the print job information encryption device encrypts the print job information, i.e., the management information of the print job and the rough image, and the encrypted print job information is sent to each client apparatus. On the other hand, in each client apparatus, the print job information decryption device decrypts the received print job information, and the decrypted print job information is displayed as the list of print job.

Brief Summary Text (26):

Here, when one of the client apparatus sends the encrypted print data, the only one of the client apparatuses can decrypt the encrypted print job information with respect to this print data, and display the decrypted print job information. Namely, other client apparatuses cannot decrypt this encrypted print job information, and cannot display this print job information. Accordingly, it is possible to keep the contents of this print data secret.

Brief Summary Text (27):

According to the present invention, the aforementioned second object can be also achieved by a print managing apparatus wherein when secret setting information to instruct to make a secret of the print data is sent from one of the client apparatuses to the printing apparatus, the print job information sending device of the printing apparatus does not send the print job information to other client apparatus.

Brief Summary Text (28):

According to the present invention, the aforementioned first object can be also achieved by a method of managing the print job in a print managing system having: a plurality of client apparatuses for generating print data and sending the generated print data to a printing apparatus; and the printing apparatus connected with each of the client apparatuses through a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, the method having the processes of: generating the print data in each of the client apparatuses; sending the generated print data from each of the client apparatuses to the printing apparatus; receiving the print data from each of the client apparatuses in the printing apparatus; storing the received print data in the printing apparatus; producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data in the printing apparatus; storing the produced rough image, and correlating the produced rough image with the stored print data, on which the produced rough image is based, in the printing apparatus; managing the stored print data as the print job in the printing apparatus; sending a request signal to request print job information from each of the client apparatuses to the printing apparatus; receiving the request signal from each of the client apparatuses, in the printing apparatus; sending the print job information including management information to identify the print job managed in the print job managing process and the rough image correlated with the print data corresponding to the print job from the printing apparatus to each of the client apparatuses, in response to a reception of the request signal; receiving the print job information from the printing apparatus, in each of the client apparatuses; and displaying the received print job information as a list, in which the management information of the print job and the rough image correlated with the print data corresponding to the print job included in the received print job information are arranged. Thus, when a user views the list, the user can easily identify the print job by the rough image.

Brief Summary Text (29):

According to the present invention, the aforementioned second object can be also achieved by a method of managing the print job in a print managing system having: a plurality of client apparatuses for generating print data and sending the generated print data to a printing apparatus; and the printing apparatus connected with each of the client apparatuses through a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, the method having the processes of: generating the print data in each of the client apparatuses; encrypting the generated print data in each of the client apparatuses; sending the encrypted print data from each of the client apparatuses to the printing apparatus; receiving the encrypted print data from each of the client apparatuses in the printing apparatus; decrypting the received print data in the printing apparatus; storing the decrypted print data in the printing apparatus; producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data in the printing apparatus; storing the produced rough image, and correlating the produced rough image with the stored print data, on which the produced rough image is based, in the printing apparatus; managing the stored print data as the print job in the printing apparatus; sending a request signal to request print job information to the printing apparatus, in each of the client apparatuses; receiving the request signal from each of the client apparatuses, in the printing apparatus; encrypting the print job information including management information to identify the print job managed in the print job managing process and the stored rough image correlated with the print data corresponding to the print job, in the printing apparatus; sending the encrypted print job information from the printing apparatus to each of the client apparatuses in response to the received request signal; receiving an encrypted print job information from the printing apparatus, in each of the client apparatuses; decrypting the received print job information in each of the client apparatuses; and displaying the decrypted print job information as a list, in which the management information of the print job and the rough image correlated with the print data corresponding to the print job included in the decrypted print job information are arranged, in each of the client apparatuses. Accordingly, it is possible to keep the contents of this print data secret.

Drawing Description Text (7):

FIG. 5 is diagram showing a list of print jobs displayed on a display of the computer of the first embodiment of the present invention;

Drawing Description Text (15):

FIG. 12 is a diagram showing a list of print jobs displayed on a display of the computer of the second embodiment of the present invention.

Detailed Description Text (4):

In this print managing system, the print data outputted by the client apparatus 1 or 2 is sent to the network printer 3 through the network 4, and managed by the network printer 3 at a unit referred to as a print job. Then, if the client apparatus 1 or 2 requires the network printer 3 to send the information of the print job, rough image data together with print job management information is sent by the printer 3 to the client apparatus 1 or 2 through the network 4.

Detailed Description Text (31):

The print job managing device 3c is a device for managing the print data stored in the print job storing device 3c for each print job. Further, the print job managing device 3c manages an order of executing the print job, the execution situation and the like by using the print job management information, such as a print job name, a data size, an owner name, a total page, a reception time when the print job is received and the like, which are sent in conjunction with each print data.

Detailed Description Text (39):

The print job sending device 3h, in accordance with the request sent by the print job request device 1c of the client apparatuses 1 or 2, receives the print job management information from the print job managing device 3c, and receives the rough image data from the rough image storing device 3g, and then outputs to the print job receiving device 1d of each client apparatus 1, 2, as the print job data.

Detailed Description Text (40):

The print managing system in this embodiment has the functions as mentioned above. Thus, the rough image data produced in accordance with the print data of each print job is displayed on the print job display device 1e, together with the print job management information, such as the print job name, the print reception time and the like. Hence, the user of the client apparatus can easily identify and select the content of each print job.

Detailed Description Text (45):

On the other hand, when a request command for print job information is inputted in the client apparatus 1 or 2, the print job request device 1c requires the printer 3 to send the print job data (Step S3). When this requirement is received by the print job sending device 3h (Step S9), the print job sending device 3h receives the print job management information with respect to the print data stored in the spool area from the print job managing device 3c, and further receives the stored rough image data, which is correlated to each print data, from the rough image storing device 3g. Then, the print job sending device 3h sends the print job management information and the rough image data to the client apparatus 1 or 2 as the print job data (Step S10).

Detailed Description Text (47):

As shown in FIG. 5, a list of the print jobs is displayed on the display 15. The list is divided into display blocks 5 corresponding to the respective print jobs. A display area 6 for the rough image and display areas for a print job name, a print reception time, a data size, an owner, a total page and the like are disposed on each display block 5. Each rough image is displayed on the display area 6. Thus, a user can easily identify and select the print job from such a list.

Detailed Description Text (52):

As mentioned above, when the small number of the displayed pages is specified, only the necessary minimum rough image is sent to the client apparatus. Thus, it is possible to quickly display the print job information.

Detailed Description Text (54):

As mentioned above, according to this embodiment, the rough image of the print data is produced for each print job in the printer 3, sent to the client apparatus 1 or 2, and then, displayed in the list of the print jobs in the client apparatus 1 or 2. Thus, it is possible to easily identify the content of each print job. For example, this reduces the possibility of an erroneous operation, such as an accidental deletion of the necessary print job and the like.

Detailed Description Text (90):

On the other hand, when a request command for print job information is inputted in the client apparatus 201 or 202, the print job request device 1d requires the printer 203 to send the print job data (Step S55). When this requirement is received by the print a job sending device 3k (Step S66), the print job sending device 3k receives the print job management information with regard to the print data stored in the spool area from the print job managing device 3d, and further receives the stored rough image data, which is correlated to each print data, from the rough image storing device 3h. However, at this time, it is determined by the determining device 203m whether or not it is necessary that the print job

information including the rough image data is encrypted (Step S67). If the based print data is encrypted, it is determined that the encryption is necessary (Step S67; YES). Then, the print job information including the rough image data is encrypted by the print job encryption device 203k. If the based print data is not encrypted, it is determined that the encryption is not necessary (Step S67; NO).

Detailed Description Text (94):

However, since the encrypted print job information of the other client apparatus cannot be decrypted, it is not displayed, as shown in FIG. 12. Namely, in FIG. 12, contents or values of the print job name, the print reception time, the data size, the owner, the total page and the like are not displayed in the display block 5a, and a rough image is not displayed in a display area 6a. Hence, it is never known by the other people.

Detailed Description Text (96):

As mentioned above, according to the second embodiment, the rough image of the print data is produced for each print job and sent to the client apparatus, which displays the rough image in a list display for the print job. Thus, it is possible to easily identify and select the content of each print job.

Detailed Description Text (97):

Further, the print data which must be kept secret cannot be viewed by client apparatuses other than a predetermined client apparatus. Thus, the security can be ensured. Moreover, when encrypting the rough image data, the information for the print job itself, such as a size of the print data, an output time and the like, can be encrypted to further protect the escape of the information.

Detailed Description Text (104):

On the other hand, in the network printer 3, if the print data and the secret setting information are received by the print data receiving device 3a and then the client apparatus requires to send the print job information, the secret setting information corresponding to the print data is determined by the CPU 16 whether or not the print job information corresponding to the print data can be sent. As a result, if the data can be published, the print job data is sent by the print job sending device 3k. However, if the data should be kept secret, the print job data is not sent.

Detailed Description Text (105):

Therefore, since the print job information to be kept secret is not displayed in the other client apparatuses, the security can be ensured.

Detailed Description Text (109):

Furthermore, when the rough image data is not sent or produced, if it is constructed so as not to send or generate the information of the print job itself, such as a sending person, a size of print data, an output time and the like, this can further protect the escape of the information.

CLAIMS:

1. A print managing system comprising:

a plurality of client apparatuses for generating print data and sending the generated print data to a printing apparatus; and

the printing apparatus connected with each of the client apparatuses though a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is a unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, each of the client apparatuses comprising:

a print data generating device for generating the print data;

a print data sending device for sending the generated print data to the printing apparatus;

a print job information request device for sending a request signal to request print job information to the printing apparatus;

a print job information receiving device for receiving the print job information from the printing apparatus; and

a print job information display device having a display area for displaying the received print job information as a list, in which management information of the print job and a rough image correlated with the print data corresponding to the print job included in the received print job information are arranged both the management information and the corresponding rough image being arranged in the display area at a time in a one-to-one corresponding manner,

the printing apparatus comprising:

a print data receiving device for receiving the print data from each of the client apparatuses;

a print data storing device for storing the received print data;

a rough image producing device for producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data;

a rough image storing device for storing the produced rough image, and correlating the produced rough image with the stored print data on which the produced rough image is based;

a print job managing device for managing the stored print data as the print job, and generating the management information to identify the print job;

a request receiving device for receiving the request signal from each of the client apparatuses;

a print job information sending device for sending the print job information including the management information and the rough image correlated with the print data corresponding to the print job to each of the client apparatuses in response to a reception of the request signal;

a converting device for converting the print data stored by the print data storing device into output image data which corresponds to an image or text that is ultimately printed out from the printing apparatus;

an output image data storing device for storing the output image data; and

a printing device for printing out an output corresponding to the output image data,

wherein the management information and the rough image included in the print job sent by the print job information sending device are correlated with each other and each correspond to the common print job, and

wherein a size of data of the rough image is smaller than a size of the output image data.

2. A method of managing the print job in a print managing system comprising:

a plurality of client apparatuses for generating print data and sending the generated print data to a printing apparatus; and

the printing apparatus connected with each of the client apparatuses through a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is an unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, the method comprising the processes of:

generating the print data in each of the client apparatuses;

sending the generated print data from each of the client apparatuses to the printing apparatus;

receiving the print data from each of the client apparatuses in the printing apparatus;

storing the received print data in the printing apparatus;

producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data in the printing apparatus;

storing the produced rough image in a rough image storing device disposed in the printing apparatus, and correlating the produced rough image with the stored print data, on which the produced rough image is based, in the printing apparatus;

managing the stored print data as the print job in the printing apparatus and generating the management information to identify the print job;

sending a request signal to request print job information from each of the client apparatuses to the printing apparatus;

receiving the request signal from each of the client apparatuses, in the printing apparatus;

sending the print job information including management information and the rough image correlated with the print data corresponding to the print job from the printing apparatus to each of the client apparatuses, in response to a reception of the request signal;

receiving the print job information from the printing apparatus, in each of the client apparatuses;

displaying the received print job information in a display area of a display device disposed in each of the client apparatuses as a list, in which the management information of the print job and the rough image correlated with the print data corresponding to the print job included in the received print job information are arranged, both the management information and the corresponding rough image being arranged; in the display area at a time in a one-to-one corresponding manner;

converting the print data stored in the printing apparatus into output image data which corresponds to an image or text that is ultimately printed out from the printing apparatus;

storing the output image data into an output image data storing device disposed in the printing apparatus; and

printing out an output image corresponding to the output image data from the



printing apparatus,

wherein the management information and the rough image included in the print job information sent from the printing apparatus to each of the client apparatuses are correlated with each other and each correspond to the common print job, and

wherein a size of data of the rough image is smaller than a size of the output image data.

3. A method of managing the print job in a print managing system comprising:

a plurality of client apparatuses for generating print data and sending the generated print data to a printing apparatus; and

the printing apparatus connected with each of the client apparatuses through a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is a unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, the method comprising the processes of:

generating the print data in each of the client apparatuses;

encrypting the generated print data in each of the client apparatuses;

sending the encrypted print data from each of the client apparatuses to the printing apparatus;

receiving the encrypted print data from each of the client apparatuses, in the printing apparatus;

decrypting the received print data in the printing apparatus;

storing the decrypted print data in the printing apparatus;

producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data in the printing apparatus;

storing the produced rough image in a rough image storing device disposed in the printing apparatus and correlating the produced rough image with the stored print data, on which the produced rough image is based, in the printing apparatus;

managing the stored print data as the print job in the printing apparatus and generating the management information to identify the print job;

sending a request signal to request print job information from each of the client apparatuses to the printing apparatus;

receiving the request signal from each of the client apparatuses, in the printing apparatus;

encrypting the print job information including management information and the stored rough image correlated with the print data corresponding to the print job, in the printing apparatus;

sending the encrypted print job information from the printing apparatus to each of the client apparatuses in response to a reception of the request signal;

receiving an encrypted print job information from the printing apparatus, in each of the client apparatuses;

decrypting the received print job information in each of the client apparatuses;

displaying the decrypted print job information in a display area of a display device disposed in each of the client apparatuses as a list, in which the management information of the print job and the rough image correlated with the print data corresponding to the print job included in the decrypted print job information are arranged both the management information and the corresponding rough image being arranged in the display area at a time in a one-to-one corresponding manner;

converting the decrypted print data stored in the printing apparatus into output image data which corresponds to an image or text that is ultimately printed out from the printing apparatus;

storing the output image data into an output image data storing device disposed on the printing apparatus; and

printing out an output image corresponding to the output image data stored in the output image data storing device,

wherein the management information and the rough image included in the encrypted print job information sent from the printing apparatus to each of the client apparatuses are correlated with each other and each correspond to the common print job,

wherein a size of data of the rough image is smaller than a size of the output image data, and a capacity of the rough image storing device is smaller than a capacity of the output storing device, and

wherein the display area is divided into a plurality of display sections, the print job information corresponding to a plurality of print jobs are arranged in the display sections in a way that the print job information corresponding to each of the print jobs is arranged in the different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-one corresponding manner.

4. A program storage device readable by a first computer included in each of a plurality of client apparatuses and a second computer included in a printing apparatus in a print managing system comprising:

the plurality of client apparatuses for generating print data and sending the generated print data to the printing apparatus; and

the printing apparatus connected with each of the client apparatuses through a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is a unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, tangibly embodying a program of instructions executable by the first computer and the second computer to perform method processes for managing the print job, said method processes comprising:

generating the print data in each of the client apparatuses;

sending the generated print data from each of the client apparatuses to the printing apparatus;

receiving the print data from each of the client apparatuses, in the printing apparatus;

storing the received print data in the printing apparatus;

producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data in the printing apparatus;

storing the produced rough image in a rough image storing device disposed in the printing apparatus and correlating the produced rough image with the stored print data, on which the produced rough image is based, in the printing apparatus;

managing the stored print data as the print job in the printing apparatus and generating the management information to identify the print job;

sending a request signal to request print job information from each of the client apparatuses to the printing apparatus;

receiving the request signal from each of the client apparatuses, in the printing apparatus;

sending the print job information including management information and the rough image correlated with the print data corresponding to the print job from the printing apparatus to each of the client apparatuses, in response to a reception of the request signal;

receiving the print job information from the printing apparatus, in each of the client apparatuses;

displaying the received print job information in a display area of a display device disposed in each of the client apparatuses as a list, in which the management information of the print job and the rough image correlated with the print data corresponding to the print job included in the received print job information are arranged both the management information and the corresponding rough image being arranged in the display area at a time in a one-to-one corresponding manner;

converting the print data stored in the printing apparatus into output image data which corresponds to an image or text that is ultimately printed out from the printing apparatus;

storing the output image data onto an output image data storing device disposed in the printing apparatus; and

printing out an output image corresponding to the output image data from the printing apparatus,

wherein the management information and the rough image included in the print job information sent from the printing apparatus to each of the client apparatuses are correlated with each other and each correspond to the common print job, and

wherein a size of data of the rough image is smaller than a size of the output image data.

5. A program storage device readable by a first computer included in each of a plurality of client apparatuses and a second computer included in a printing apparatus in a print managing system comprising:

the plurality of client apparatuses for generating print data and sending the generated print data to the printing apparatus; and

the printing apparatus connected with each of the client apparatuses through a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is a unit corresponding to one print data received from each of the client apparatuses, and printing the received print

data for each print job, tangibly embodying a program of instructions executable by the first computer and the second computer to perform method processes for managing the print job, said method processes comprising:

generating the print data in each of the client apparatuses;

encrypting the generated print data in each of the client apparatuses;

sending the encrypted print data from each of the client apparatuses to the printing apparatus;

receiving the encrypted print data from each of the client apparatuses, in the printing apparatus;

decrypting the received print data in the printing apparatus;

storing the decrypted print data in the printing apparatus;

producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data in the printing apparatus;

storing the produced rough image in a rough image storing device disposed in the printing apparatus, and correlating the produced rough image with the stored print data, on which the produced rough image is based, in the printing apparatus;

managing the stored print data as the print job in the printing apparatus, and generating the management information to identify the print job;

sending a request signal to request print job information from each of the client apparatuses to the printing apparatus;

receiving the request signal from each of the client apparatuses, in the printing apparatus;

encrypting the print job information including management information and the stored rough image correlated with the print data corresponding to the print job, in the printing apparatus;

sending the encrypted print job information from the printing apparatus to each of the client apparatuses in response to a reception of the request signal;

receiving an encrypted print job information from the printing apparatus, in each of the client apparatuses;

decrypting the received print job information in each of the client apparatuses;

displaying the decrypted print job information in a display area of a display device disposed in each of the client apparatuses, as a list, in which the management information of the print job and the rough image correlated with the print data corresponding to the print job included in the decrypted print job information are arranged both the management information and the corresponding rough image being arranged in the display area at a time in a one-to-one corresponding manner;

converting the decrypted print data stored in the printing apparatus into output image data which corresponds to an image or text that is ultimately printed out from the printing apparatus;

storing the output image data into an output image data storing device disposed in the printing apparatus; and

printing out an output corresponding to the output image data stored in the output data storing device,

wherein the management information and the rough image included in the encrypted print job information sent from the printing apparatus to each of the client apparatuses are correlated with each other and each correspond to the common print job,

wherein a size of data of the rough image is smaller than a size of the output image data, and a capacity of the rough image storing device is smaller than a capacity of the output image data storing device, and

wherein the display area is divided into a plurality of display sections, the print corresponding to a plurality of print jobs are arranged on the display sections in a way that the print job information corresponding to each of the print jobs is arranged in a different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-one corresponding manner.

6. A print managing system comprising a plurality of client apparatuses for generating print data and sending the generated print data to a printing apparatus, and the printing apparatus connected with each of the client apparatuses through a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is a unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, each of the client apparatuses comprising:

a print data generating device for generating the print data;

a print data encryption device for encrypting the generated print data;

a print data sending device for sending the encrypted print data to the printing apparatus;

a print job information request device for sending a request signal to request print job information to the printing apparatus;

a print job information receiving device for receiving an encrypted print job information from the printing apparatus;

a print job information decryption device for decrypting the received print job information; and

a print job information display device having a display area for displaying the decrypted print job information as a list, in which management information of the print job and a rough image correlated with the print data corresponding to the print job included in the received print job information are arranged, both the management information and the corresponding rough image being arranged in the display area at a time in a one-to-one corresponding manner,

the printing apparatus comprising:

a print data receiving device for receiving the encrypted print data from each of the client apparatuses;

a print data decryption device for decrypting the received print data;

a print data storing device for storing the decrypted print data;

a rough image producing device for producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data;

a rough image storing device for storing the produced rough image, and correlating the produced rough image with the stored print data on which the produced rough image is based;

a print job managing device for managing the stored print data as the print job, and generating the management information to identify the print job;

a request receiving device for receiving the request signal from each of the client apparatuses;

a print job information encryption device for encrypting the print job information including the management information and the rough image correlated with the print data corresponding to the print job;

a print job information sending device for sending the encrypted print job information to each of the client apparatuses in response to a reception of the request signal;

a converting device for converting the print data stored in the print data storage device into output image data which corresponds to an image or text that is ultimately printed out from the printing apparatus;

an output image data storing device for storing the output image data; and

a printing device for printing out an output image corresponding to the output image data,

wherein the management information and the rough image included in the encrypted print job information sent by the print job information sending device are correlated with each other and each correspond to the common print job,

wherein a size of data of the rough image is smaller than a size of the output image data and a capacity of the rough storing device is smaller than a capacity of the output storing device, and

wherein the display area is divided into a plurality of display sections, the print job information corresponding to a plurality of print jobs are arranged in the display sections in a way that the print job information corresponding to each of the print jobs is arranged in the different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-one corresponding manner, the rough image producing device changing a size of the produced rough image according to a size of printing paper to be used for printing the stored print data.

7. The print managing system comprising a plurality of client apparatuses for generating print data and sending the generated print data to a printing apparatus, and the printing apparatus connected with each of the client apparatuses through a network for receiving the print data from each of the client apparatuses, managing the received print data as a print job, which is a unit corresponding to one print data received from each of the client apparatuses, and printing the received print data for each print job, each of the client apparatuses comprising:

a print data generating device for generating the print data;

a print data encryption device for encrypting the generated print data;

a print data sending device for sending the encrypted print data to the printing apparatus;

a print job information request device for sending a request signal to request print job information to the printing apparatus;

a print job information receiving device for receiving an encrypted print job information from the printing apparatus;

a print job information decryption device for decrypting the received print job information; and

a print job information display device having a display area for displaying the decrypted print job information as a list, in which management information of the print job and a rough image correlated with the print data corresponding to the print job included in the received print job information are arranged, both the management information and the corresponding rough image being arranged in the display area at a time in a one-to-one corresponding manner,

the printing apparatus comprising:

a print data receiving device for receiving the encrypted print data from each of the client apparatuses;

a print data decryption device for decrypting the received print data;

a print data storing device for storing the decrypted print data;

a rough image producing device for producing a rough image, which roughly shows an image corresponding to the stored print data, on the basis of the stored print data;

a rough image storing device for storing the produced rough image, and correlating the produced rough image with the stored print data on which the produced rough image is based;

a print job managing device for managing the stored print data as the print job, and generating the management information to identify the print job;

a request receiving device for receiving the request signal from each of the client apparatuses;

a print job information encryption device for encrypting the print job information including the management information and the rough image correlated with the print data corresponding to the print job;

a print job information sending device for sending the encrypted print job information to each of the client apparatuses in response to a reception of the request signal;

a converting device for converting the print data stored in the print data storage device into output image data which corresponds to an image or text that is ultimately printed out from the printing apparatus;

an output image data storing device for storing the output image data; and

a printing device for printing out an output image corresponding to the output image data,

wherein the management information and the rough image included in the encrypted

print job information sent by the print job information sending device are correlated with each other and each correspond to the common print job,

wherein a size of data of the rough image is smaller than a size of the output image data and a capacity of the rough storing device is smaller than a capacity of the output storing device, and

wherein the display area is divided into a plurality of display sections, the print job information corresponding to a plurality of print jobs are arranged in the display sections in a way that the print job information corresponding to each of the print jobs is arranged in the different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-one corresponding manner,

the print data sending device sends secret setting information to instruct to make a secret of the print data to the printing apparatus, together with the print data,

the print data receiving device receives the secret setting information together with the print data from each of the client apparatuses, and

when the print data receiving device receives the secret setting information from one of the client apparatuses, the print job information sending device does not send the print job information to the other client apparatuses.

9. The printing managing system according to claim 8, wherein the display area is divided into a plurality of display sections, the print job information corresponding to a plurality of print jobs are arranged in the display sections in a way that the print job information corresponding to each of the print jobs is arranged in a different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-one corresponding manner.

10. The printing managing system according to claim 1, wherein the display area is divided into a plurality of display sections, the print job information corresponding to a plurality of print jobs are arranged in the display sections in a way that the print job information corresponding to each of the print jobs is arranged in a different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-one corresponding manner.

13. The printing managing system according to claim 11, wherein

the print job information request device sends page information to select one or more pages from the plurality of pages to the printing apparatus, together with the request signal,

the request receiving device receives the page information from each of the client apparatuses, together with the request signal, and

the print job information sending device sends the print job information including the management information and the rough images of only pages selected on the basis of the received page information.

17. The method according to claim 16, wherein the display area is divided into a plurality of display sections, the print job information corresponding to a plurality of print jobs are arranged in the display sections in a way that the print job information corresponding to each of the print jobs is arranged in a different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-



one corresponding manner.

18. The method according to claim 2, wherein the display area is divided into a plurality of display sections, the print job information corresponding to a plurality of print jobs are arranged in the display sections in a way that the print job information corresponding to each of the print jobs is arranged in a different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-one corresponding manner.

20. The program storage device according to claim 19, wherein the display area is divided into a plurality of display sections, the print job information corresponding to a plurality of print jobs are arranged in the display sections in a way that the print job information corresponding to each of the print jobs is arranged in a different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-one corresponding manner.

21. The program storage device according to claim 4, wherein the display area is divided into a plurality of display sections, the print job information corresponding to a plurality of print jobs are arranged in the display sections in a way that the print job information corresponding to each of the print jobs is arranged in a different display section and, in each of the display sections, both the management information and the corresponding rough image are arranged at a time in a one-to-one corresponding manner.